



State of Washington

DEPARTMENT OF HEALTH

NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20425 72nd Avenue South, Suite 310 • Kent Washington 98032-2388

ROUTINE SANITARY SURVEY REPORT

June 8, 2018

DOCKTON WATER ASSOCIATION

ID # 19550J, King County

Persons attending

David Stoltz, Operator, Dockton Water Association (the Association)

Kelly Robinson, Manager, Dockton Water Association

Brietta Carter, Regional Engineer, Washington State Department of Health (the Department)

Laura McLaughlin, Regional Engineer, the Department

Last survey 4/1/2013 (see previous survey notes for details)

- Confirm the reservoir water level gage board cable openings are protected. – Complete. We reviewed photos during the survey. The cable enters through a rubber fitting (see Figure 11).
- Submit a project report to the Department for shallow wells source approval and Sandy Shores Well S02 treatment. – Complete. Refer to submittal #14-0506, #17-0709, and 17-1202.
- Update the existing Coliform Monitoring Plan (CMP) to include a map showing the routine and repeat sampling locations. – Complete. Map with sampling locations is separate from CMP.
- In the next Water Use Efficiency (WUE) Report identify your goal and report progress on achieving your goal. – Ongoing.
- Develop a Stage 2 disinfection byproduct monitoring plan and begin sampling by October 2013. – Complete. They monitor the same location annually.
- Develop and implement a cross-connection control program (CCCP). – Complete first draft of CCCP. Complete initial inventory of hazards. They are in the process of updating CCCP and inventory of hazards. Next steps include adopting and implementing the CCCP.
- Develop and implement a Source Water Protection Plan. – In progress.
- Install a vent on Sandy Shores Well (S02). – Complete.
- Update the water facilities inventory number of existing connections. – Complete.



System overview

The system serves five pressure zones primarily supplied by Dockton Springs through two booster pump stations (BPSs), two storage tanks, and three pressure reducing valve (PRV) stations. The Sandy Shores well (high iron and manganese) supplements Dockton Springs to meet peak demand. The Sandy Shores well treatment objective is for distribution residual. The Dockton Springs, with a hydraulic connection to surface water, has a treatment objective to provide CT6 disinfection.

The system holds a green operating permit and has approval for 485 residential connections. They serve a population of around 600 through 384 residential connections and 7 non-residential connections. They meet the certified operator requirement (WDM1, CCS).

Sources

- Dockton Park Springs (S01) – Dockton Springs.
- Sandy Shores Well AAB173 (S02) – Sandy Shores well.
- Hake Springs (S03) – Inactive.
- Drilled WF (S04) – wellpoints approved for emergency use, GWI determination underway, estimated source capacity of 12.5gpm.

Dockton Park Springs (S01) – Dockton Springs

The Dockton Springs capacity of 142gpm is based on water rights. Typical production capacity is under 80gpm. Multiple driven wellpoints to 15-foot depth siphon to lower collection chamber (Figures 1-3).



Figure 1. Dockton Springs. (Left) Map depicting the locations of the wellpoints. Pink denotes buildings; blue denotes surface water (provided by Association in 2013). (Right) Wellpoint 8. They work to keep the piping visible and out of standing water to minimize the possibility of contamination.



Figure 2. Dockton Springs (S01). (Left) The neighboring property has new owners since the last survey. The new owners do not have horses. (Right) The wellpoints shown here used to flow through an upper reservoir. The upper reservoir is no longer in use and all the wellpoints for Dockton Springs flow to the collection chamber.



Figure 3. Collection chamber. (Left) Overview showing the black pipes from the wellpoints entering the collection chamber. The retired upper reservoir is in the background. (Right) Inside the collection chamber. The screened overflow (not 24-mesh) goes to a dedicated vault that overflows to the hillside (not shown here).

The raw water flow meter, on the line between the collection chamber and the chlorine contact tank, controls the chlorine injection flow pump (Figures 4 and 5).

They measure flow rate and chlorine residual at entry point to distribution from the Dockton Springs booster station (Figure 6). For a maximum flow rate of 143 gpm, the minimum chlorine residual at entry point must be 0.55 mg/L for CT6. Monthly reports indicate they consistently meet the CT6 requirement.

The Dockton Springs booster station delivers water to the two storage tanks in the 430 pressure zone and the directly to the 246 pressure zone.



Figure 4. (Left) Vault with the raw water flow meter, sample tap, and chlorine injection line. This meter controls the chlorine injection. (Right) Hypochlorite disinfection treatment plant with NSF certified hypochlorite, hose for make-up water, 3 parts water and 1 part 12.5% sodium hypochlorite, flow paced peristaltic feed pump.



Figure 5. Baffled chlorine contact tank. (Left) View from the vertical access hatch. Purple manganese staining. (Right) Overall good screens and seals. Please double check the seal between the walls and the roof.

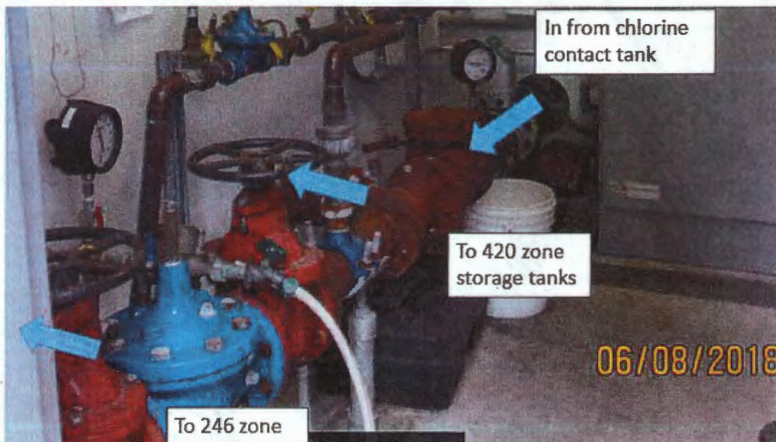


Figure 6. Dockton Springs booster station with variable frequency drives.

Sandy Shores Well AAB173 (S02) – Sandy Shores well

The Sandy Shores Well is used seasonally to meet peak demand (Figure 7). Manganese and iron exceed the secondary maximum contaminant levels (MCLs) (aesthetic concern). All primary MCLs (health concerns) are in compliance. The Association plans to rebuild the well house and install treatment for iron and manganese removal. WTPO1 certification will be required upon completion of the treatment plant.

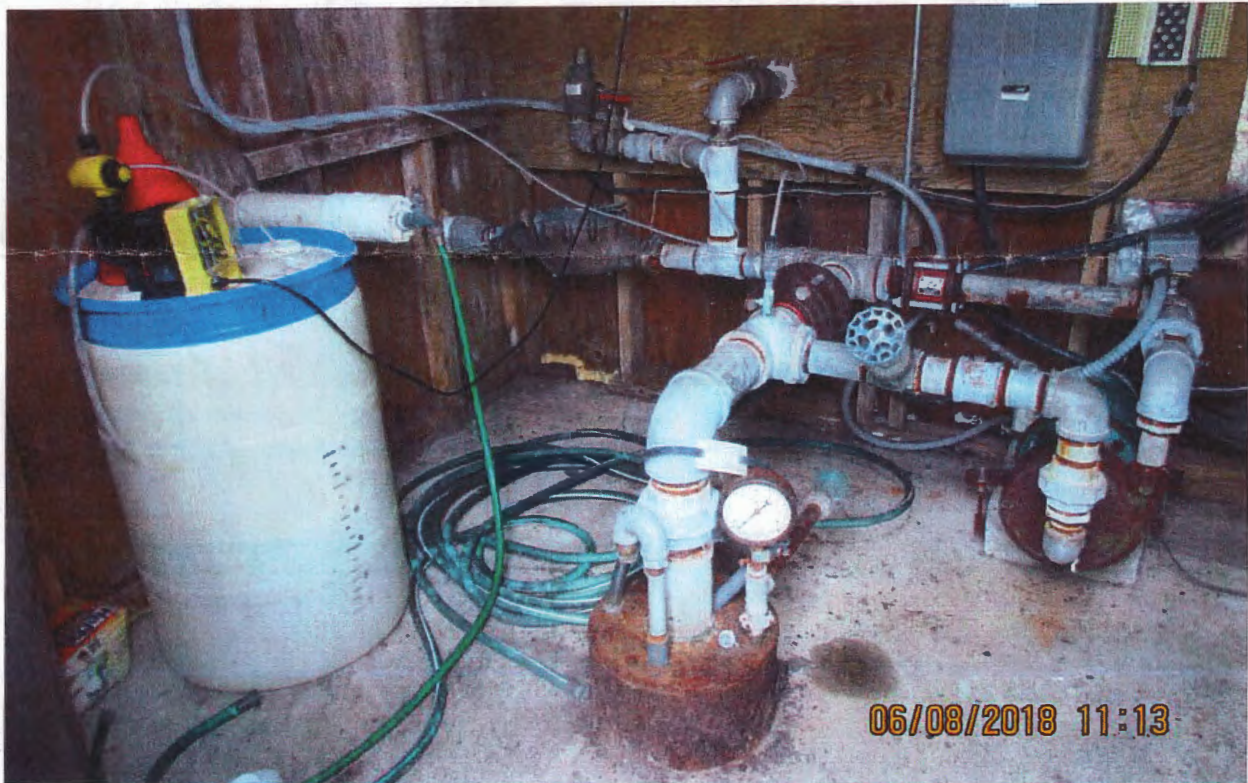


Figure 7. Sandy Shores well, 100gpm Qi, and sodium hypochlorite disinfection treatment. Make up water for the hypochlorite solution fed by the hose. LMI feed pump. They keep a spare LMI feed pump and parts at the office. The sanitary control area is in good condition. Good seals and screens. The discharge line that goes out through the back wall serves as a raw source water tap. Propane back up power generator on site.

Drilled WF (S04) (Figure 8)



Figure 8. Refer to source approval report 17-0709. Please keep in mind that the wellhead plumbing is part of the approved design and should not be changed after approval.

North and South storage tanks

The system has two concrete storage tanks (310,000-gallons total) in the 430 pressure zone (Figure 9). The storage tanks serve the 520 pressure zone through the 520 zone booster station and the remaining pressure zones by gravity.



Figure 9. North and South storage tanks. Float control tank level controls Dockton Springs by radio transmittance. No pressure transducer. (Left) Overview. (Right) Vent on the overflow pipe.

Seals and screens

I inspected photos of North and South the storage tank access hatches, level indicator cable entry, and air vents at the Association office. The overflows need finer mesh screens to keep insects out (Figure 10). The storage tank drain line daylight is behind the fence to neighboring property (did not observe).



Figure 10. Storage tank overflows with screen (maybe 4-mesh). Overflows need 24-mesh screen to prevent insects from entering the tank. Ideally, there is an airgap.

The access hatches and level indicator cable entry appear to protect the storage tanks from contamination (Figure 11). However, the lock hatch is on the top of the access hatch lid, which makes it more difficult to seal from rain (see photos from last survey). Think about retrofitting the access hatch so the lock is on the side of the lid and not the top of the lid. Nice job on adding the gasket seal on the storage tank access hatches.

Please replace the storage tank air vents. We often observe debris accumulation on the horizontal screen of these types of air vents (Figure 11).



Figure 11. (Left) Level indicator cable is covered with the metal tent. The cable enters the roof through the rubber fitting. (Center) Air vent design allows debris to collect on the horizontal screen underneath. (Right) Air vent screen. (Photos provided by the Association during the survey).

Storage capacity and water quality

Adequate turnover in the storage tanks (one or two day hydraulic retention time). The inlet was reconfigured to enter at the top of the tank through a duckbill type valve promoting mixing.

520 zone booster station

This is a constant run pump station controlled by discharge pressure (Figure 12). As a closed system (does not pump to atmospheric pressure storage in the pressure zone) it is the only source of pressure to the 520 zone. The industry standard is to provide backup power supply with automatic transfer for closed system BPSs. Please consider.



Figure 12. 520 BPS. Below grade vault. No backup power generator. Constant run pump station. (Left) Booster pump controls, cla-valve, flow meter, two 3/4hp pumps. (Right) 5hp pump, 50hp pump.

Weekly (or biweekly) visits to check on the pressure settings, flow meter reading, security, and overall condition.

Small Water System Management Program (SWSMP) status

Last plan approval date 01/18/2005. Last plan submitted #13-0317. The Department does not have any record of a response to comments, thus the #13-0317 submittal was not approved. Information about next steps for the Association to get the 2013 SWSMP approved was provided in separate correspondence.

Financial / staffing

They eliminated the tiered rate structure. We talked about how other systems find success with the tiered rate structure as a way to incentivize conservation. The Association charges a \$12/month capital fee to fund the reserve (current balance of \$700,000).

The Association has a board of directors, one part time manager, one part time certified operator, one part time (1hour/ day) chlorine residual monitor, one part time administrator for billing, and one part time meter reader.

Asset management

The Department uses the asset management plan presented in the 2013 SWSMP as an example for other systems to follow. The Association has a long-term goal to integrate assets into a geographical information system.

Projects complete / planned

The Department issued approval for the Sandy Shores well iron and manganese removal treatment on April 4, 2018. Keep in mind the approval is valid for two years. Please contact the Department prior to expiration to discuss the possibility of extending the approval.

The Association is developing an additional 12.5gpm from S04 wellpoints near the Dockton Springs source (submittal #17-0709). Currently approved for emergency use to meet peak demand.

For on-going main replacement projects, please keep in mind that the Association must submit distribution project reports and construction documents for review (WAC 246-290-110, WAC 246-290-120). The Association may request exception for submittal in the SWSMP if standard construction documents are provided.

The Association would like to see telemetry installed in order to remotely view and control system operations.

Distribution water quality, and operations and maintenance (O&M)

O&M activities include, but are not limited to, the following.

- Clean storage tanks with divers every five years. Last inspection summer of 2017.
- Dead end flushing as needed.
- Unidirectional flushing program.
- Annual hydrant testing (not performed in the last few years).
- Exercise valves.

We talked about air-vacuum valve maintenance and inspection. Refer to the September 2017 Department H2Ops publication for a suggested approach to verify the valve works as designed.

Water quality monitoring and reporting

The system is required to provide CT6 disinfection at the Dockton Springs source and maintain a detectable free chlorine residual (at least 0.2mg/L free chlorine) in the distribution system. Recent reports show the system meets these requirements. The operator mentioned a dead end area of the system that loses chlorine residual every couple of weeks or every couple of months, depending on demand. They respond with flushing.

Required distribution monitoring includes 1) disinfectant by products, 2) lead and copper, 3) coliform, and 4) asbestos. All parameters are in compliance.

Coliform monitoring and E.coli response plan

No bacteriological detections reported since the last survey. They have excellent distribution of routine sample locations, at least one in each pressure zone.

I recommend developing an *E. coli* response plan in case of an *E. coli* MCL violation or in case of identifying *E. coli* in raw source water under the Groundwater Rule. Our experience indicates that consumers want this water quality information as soon as possible and an *E. coli* response plan can position a community for success.

Cross connection control program

Northwest Water furnished a draft CCCP a few years ago. They are in the process of updating the CCCP to meet the needs of the Association, and inventorying hazards with and without backflow prevention devices. The next community meeting agenda includes customer education about the CCCP and why it is important to protect public health.

The Association must approve the CCCP (pass resolution) to provide the Association the legal authority to implement the program.

Water use efficiency

The Association reports distribution system leakage of 14.8% for 2016 (down from a historical 31% in 2013). They have installed meters at sampling locations, and hydrants to account for water loss during sampling and flushing events. The meter reading device has programmed alarms that notify the meter reader instantly if the service meter reading is unexpected (data stored for years back). Source meter calibration verification is scheduled for this year.